611-TD-603-001

EOSDIS Core System Project

M&O Procedures: Section 3.3—System Backups

Interim Update

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Raytheon Company
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Preface

This document is an interim transmission of information that will appear in a subsequent release of Document 611-CD-600-001, *Mission Operation Procedures for the ECS Project*. This document has not been submitted to NASA for approval, and should be considered unofficial. It is intended to provide timely distribution of important information to operational sites. It addresses procedures for System Backups at operational sites, and includes modifications to ensure compliance with requirements for offsite storage of system backup data as specified in Document 214-CD-001-001, *Security Plan for the ECS Project*.

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Note: This document includes change bars to indicate material that has been added or changed since the previously published version.

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Contents

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3.3 System Backup and Restore

Performing regular and comprehensive system backups is one of the most important requirements of ECS operations. Backups are the insurance that essentially all of the system data is always available. If the system crashes and all disks are damaged, the System Administrator should be able to restore all of the data from the backup tapes. Accordingly, ECS includes a software product, *Legato Networker*, which is set up to perform backups automatically on a regular periodic basis. The backups copy critical data to digital linear tape, and Networker can be configured to make *clones* or copies of some or all of these data, so that it is possible to store the data (e.g., full system backups) in offsite secure storage.

System Backup is the process of copying the information from the machine, either the entire or partial system, for safe keeping for a specific time period. Restore is the process of returning the data to the machine to allow operation to continue from a specific point in time. The **root** account is the only account that is allowed to configure Networker. Anyone with a userid that has permissions to access the files is allowed to recover data.

An ***incremental backup*** copies to tape all files on a system or subsystem that were created or modified since the previous incremental backup regardless of the backup level. The purpose of an incremental backup is to insure that the most recent edition of a file is readily available in case user error or disastrous system failure causes the file to become corrupt. Incremental backups are scheduled at a time that causes minimal disruption to the users.

Incremental backups are performed automatically according to the schedule set up in the Networker Schedules windows. Incremental backups can also be requested at unscheduled times by completing the **Incremental Backup Request Form** and submitting it to the System Administrator.

A ***full system backup*** is a snapshot of the data on the entire system as of a particular date. The data are stored on tapes that are used to recreate the system in the event of a total system failure. Networker runs the full system backup on a regular schedule, usually weekly.

Document 214-CD-001-001, *Security Plan for the ECS Project*, specifies that software backups be maintained in a physically separate location, i.e., a separate building, for two months. The procedural information from Document 611-CD-600, *Mission Operation Procedures for the ECS Project*, herein includes information concerning reconfiguration of the Networker setup for backups, with specific provisions for offsite storage of full backup data. The following numbered section from that document contains the update and modification. Section 3.3.2 includes specific reference to offsite storage of full backup data. Section 3.3.3 is a new section addressing reconfiguration of Networker setup to enable the removal of backup tapes for offsite storage.

3.3.1 Incremental Backup

Non-scheduled incremental backups can be requested at any time by submitting a request through **REMEDY** for ***Incremental Backup*** to the **System Administrator**. The System

Administrator schedules and performs the incremental backup. Afterwards, the System Administrator notifies the requester that the incremental backup is complete.

The **Activity Checklist** in Table 3.3-1 provides an overview of the incremental backup processes. ***Note***: This is for manual backup outside Networker's automatic backup schedule.

Table 3.3-1. Incremental Backup - Activity Checklist

Order	Role	Task	Section	Complete?
1	Requester	Submit Request for **Incremental** Backup to System Administrator.	(I) 3.3.1	
2	System Administrator	Schedule Incremental Backup	(I) 3.3.1	
3	System Administrator	Perform Incremental Backup.	(P) 3.3.1	
4	System Administrator	Notify Requester when Incremental Backup is Complete.	(I) 3.3.1	

Detailed procedures for tasks performed by the System Administrator are provided in the sections that follow.

The procedures assume that the requester's request for an incremental backup has already been approved by DAAC Management. Incremental backups can be requested at any time by submitting a request for ***Incremental Backup*** to the **System Administrator**. In order to perform the procedure, the System Administrator must have obtained the following information from the requester:

a. Name of machine(s) to be backed up

b. Files/directories to be backed up (optional)

Table 3.3-2 presents the steps required to perform a non-scheduled incremental backup. If you are already familiar with the procedure, you may prefer to use this quick-step table. If you are new to the system, or have not performed this task recently, you should use the following detailed procedure:

Note: If you run out of tapes at any time during this procedure, execute procedure 3.3.6.1 Labeling Tapes and then return to this procedure.

1 Log into the Legato Server by typing: **ssh** ***LegatoServerName***, then press the **Return/Enter** key.

2 At the Passphrase prompt: enter ***YourPassphrase***, then press the **Return/Enter** key.

- Or press **Return** twice to get the Password prompt.

3 Enter ***YourPassword***, then press the **Return/Enter** key**.**

- Remember that ***YourPassword*** is case sensitive.

- You are authenticated as yourself and returned to the UNIX prompt.

4 Log in as root by typing: **su**, then press the **Return/Enter** key.

- A password prompt is displayed.

5 Enter the ***RootPassword***, then press the **Return/Enter** key.

- Remember that the ***RootPassword*** is case sensitive.
- You are authenticated as root and returned to the UNIX prompt.

6 Execute the NetWorker Administrative program by entering: **nwadmin &**, then press the **Return/Enter** key.

- A window opens for the NetWorker Administrative program.
- You are now able to perform an incremental backup.

7 Click **Clients**.

- Click **Client Setup**.
- Click Host Being Backed Up.
- Highlight the group to be Backed Up.

8 Go to the **Customize** menu, select **Schedules**.

- The **Schedules** window opens.

9 Look at the button for today. If there is an **i** next to the date on this button, go to step 12.

- The **i** stands for incremental.
- The **f** stands for full.
- Whichever is on the button for today is what kind of backup that will be done, unless it is overridden.

10 Click and hold the button for today, select **Overrides** from the resulting menu, select **Incremental** from the next resulting menu.

11 Click the **Apply** button.

12 Close the **Schedules** window by clicking in the upper left corner of the **Schedules** window and selecting **Close** from the resulting menu.

13 Click the **Group Control** button.

- The **Group Control** window opens.

14 Click the **Start** button.

- A **Notice** window opens.

15 Click the **OK** button.

- The **Notice** window closes.
- The regularly scheduled backup will still run (even though we are now doing a backup).

16 Close the **Group Control** window by clicking in the upper left corner of the **Group Control** window and selecting **Close** from the resulting menu.

- Status updates appear in the **nwadmin** window.
- When the backup is complete, a **Finished** message will appear.

17 If the button for today in step 9 had an **i** on it, go to step 21.

18 Go to the **Customize** menu, select **Schedules**.

- The **Schedules** window opens.

19 Click and hold the button for today, select **Overrides** from the resulting menu, select **Full** from the next resulting menu.

20 Click the **Apply** button.

21 Close the **Schedules** window by clicking in the upper left corner of the **Schedules** window and selecting **Close** from the resulting menu.

22 Select **Exit** from the **File** menu to quit the NetWorker Administrative program.

- The **nwadmin** window closes.

23 At the UNIX prompt for the **machine to be backed up**, type **exit** then press the **Return/Enter** key.

- **Root** is logged out.

24 Type **exit** again, then press the **Return/Enter** key.

- You are logged out and disconnected from the **machine to be backed up**.

Table 3.3-2. Perform Incremental Backup - Quick-Step Procedures

Step	What to Enter or Select	Action to Take
1	**ssh** *BackedUpSystemName*	enter text; press **Return/Enter**
2	*YourPassphrase* **or-** (No entry)	enter text; press **Return/Enter** -or- (No action)
3	*YourPassword*	enter text; press **Return/Enter**
4	**su**	enter text; press **Return/Enter**
5	*RootPassword*	enter text; press **Return/Enter**
6	**nwadmin &**	enter text; press **Return/Enter**
7	Click **Clients** Click **Client Setup** Click Host Being Backed Up **-** Highlight the Group to be Backed Up	**click** options
8	Menu path **Customize** → **Schedules**	**click** option
9	Observe button for today; if **i**, go to Step 12	**read text**
10	Hold button for today to obtain menu; menu path **Overrides** → **Incremental**	**click** option
11	Activate **Apply** button	**single-click**
12	Close **Schedules** window	**click select**
13	Activate **Group Control** button	**single-click**
14	Activate **Start** button	**single-click**
15	Activate **OK** button	**single-click**
16	Close **Group Control** window	**click select**
17	(No entry)	**if there was an i on today's button in step 8, go to step 17.**
18	Menu path **Customize** → **Schedules**	**click** option
19	Hold button for today to obtain menu; menu path **Overrides** → **Full**	**click** option
20	Activate **Apply** button	**single-click**
21	Close **Schedules** window	**click select**
22	Menu path **File** → **Exit**	**click** option
23	**exit**	**press Return**
24	**exit**	**press Return**

3.3.2 Full Backup

Non-scheduled full backups can be requested at any time by submitting a request for ***Full Backup*** to the System Administrator. The System Administrator schedules and performs the full backup. Afterwards, the System Administrator notifies the requester that the full backup is complete. In preparation for offsite storage, it is also necessary to copy the file index to a tape for storage offsite with the system backups.

The **Activity Checklist** in Table 3.3-3 provides an overview of the full backup processes.

Table 3.3-3. Full Backup - Activity Checklist

Order	Role	Task	Section	Complete?
1	Requester	Submit Request for **Full** Backup to System Administrator.	(I) 3.3.2	
2	System Administrator	Schedule Full Backup	(I) 3.3.2	
3	System Administrator	Perform Full Backup.	(P) 3.3.2	
4	System Administrator	Notify Requester when Full Backup is Complete.	(I) 3.3.2	

Detailed procedures for tasks performed by the System Administrator are provided in the sections that follow.

The procedures assume that the requester's application for a full backup has already been approved by DAAC Management. In order to perform the procedure, the System Administrator must have obtained the following information from the requester:

a. Name of machine to be backed up

b. Files/directories to be backed up (optional)

Table 3.3-4 presents the steps required to perform a full backup for the requester. If you are already familiar with the procedure, you may prefer to use this quick-step table. If you are new to the system, or have not performed this task recently, you should use the following detailed procedure:

Note: If you run out of tapes at any time during this procedure, execute procedure 3.3.6.1 Labeling Tapes and then return to this procedure.

1 To log into the server, type **ssh <*hostname*>** and then press the **Return/Enter** key.

2 At the Passphrase prompt: enter ***YourPassphrase***, then press the **Return/Enter** key.

- Or press the **Return/Enter** key twice to get to Password prompt.

3 Enter ***YourPassword***, then press the **Return/Enter** key**.**

- Remember that ***YourPassword*** is case sensitive.
- You are authenticated as yourself and returned to the UNIX prompt.

4 Log in as root by typing: **su**, then press the **Return/Enter** key.

- A password prompt is displayed.

5 Enter the ***RootPassword***, then press the **Return/Enter** key.

- Remember that the ***RootPassword*** is case sensitive.
- You are authenticated as root and returned to the UNIX prompt.

6 Execute the NetWorker Backup program by entering **nwbackup &**, then press the **Return/Enter** key.

- A **NetWorker Backup** window opens.
- You are now able to perform a full backup.

7 Click Clients.

- Click Client Setup
- Click Host Being Backed Up
- Highlight the group to be Backed Up

8 If no list of **files/directories to be backed up** was provided, i.e. the whole machine is to be backed up, then type **/** in the **Selection** field; otherwise, go to Step 10.

- The character **/** is displayed in the **Selection** field.

9 Click the **Mark** button and then go to Step 12.

- A check mark next to **/** indicates that it is designated for backup.

10 If names of **file(s)/directory(ies) to be backed up** were provided, then click to select the **file(s)/directory(ies) to be backed up** in the directory display.

- Drag scroll bar with mouse to scroll the list up and down.
- Double click on a directory name to list its contents.
- To move up a directory level, type the path in the **Selection** field.

11 Click the **Mark** button.

- A check mark next to each selected file indicates that it is designated for backup.

12 Click the **Start** button.

- A **Backup Options** window opens.

13 Click the **OK** button.

- The **Backup Options** window closes.
- The **Backup Status** window opens providing updates on the backup's progress.

14 After the **Backup Completion Time** message appears in the **Backup Status** window, click the **Cancel** button.

- The **Backup Status** window closes.
- The backup is complete.

15 Select **Exit** from the **File** menu to quit the NetWorker Backup program.

- The **NetWorker Backup** window closes.

16 To copy the file index to tape for offsite storage, type **cp <*index_filename*> <*tape distination*>**.

17 Remove the cloned system full backup tapes from the STK jukebox for transport to secure offsite storage.

18 Replace the removed system backup tapes with a set of backup tapes rotated in from secure offsite storage.

19 At the UNIX prompt, type **exit** and then press the **Return/Enter** key.

- **Root** is logged out.

20 Type **exit** again, and then press **Return/Enter** key.

- You are logged out and disconnected from the **machine to be backed up**.

Table 3.3-4. Perform Full Backup - Quick-Step Procedures

Step	What to Enter or Select	Action to Take
1	**ssh <*hostname*>**	enter text; press **Return/Enter**
2	*YourPassphrase* **or-** (No entry)	enter text; press **Return/Enter** -or- (No action)
3	*YourPassword*	enter text; press **Return/Enter**
4	**su**	enter text; press **Return/Enter**
5	*RootPassword*	enter text; press **Return/Enter**
6	**nwbackup &**	enter text; press **Return/Enter**
7	Click Client Click **Client Setup** Click Host Being Backed Up - Highlight the Group to be Backed Up	**click** options
8	If the whole machine is to be backed up, click in the **Selection** field and type */*; otherwise, go to Step 10	**click**; enter text
9	Activate the **Mark** button	**single-click**
10	If only certain files/directories are to be backed up, select the file(s)/directory(ies) in the directory display.	**click**
11	Activate the **Mark** button	**single-click**
12	Activate the **Start** button	**single-click**
13	Activate the **OK** button in the **Backup Options** window	**single-click**
14	Activate the **Cancel** button in the **Backup Status** window	**single-click**
15	Menu path **File** → **Exit**	**click** option
16	To copy the file index to tape for offsite storage, **cp <*index_filename*><*tape destination*>**	enter text; press **Return/Enter**
17	Remove the cloned system full backup tapes from jukebox for transport to secure offsite storage	transport backup tapes and tape with index to offsite storage
18	Replace the removed system backup tapes with a set rotated in from secure offsite storage	insert tapes
19	**exit**	enter text; press **Return/Enter**

20	**exit**	enter text; press **Return/Enter**

3.3.3 Configuring Networker Setup for Backup Clones for Offsite Storage

Detailed information on configuring Networker may be found in the *Legato Networker Administrator's Guide, UNIX Version*. During installation at the sites, Networker is configured to schedule and perform automatic incremental and full backups. Therefore, much of the initial setup is complete, including licensing, designation of users who have administrative privileges, specification of *clients* (computers that contain data to be backed up) and their *save sets* (increments of data to be backed up), and identification of storage devices. If Networker is not configured to create any *clones* (duplicate copies of save sets) that can be removed from the storage device and stored at an offsite location, it will be necessary to change the *pools* (collections of backup tape volumes in the storage device) to implement offsite storage. Specifically, it will be appropriate to specify separate pools for full backups and incremental backups, and for clones of the associated full backup save sets that can be stored off site.

The purpose of off-site storage of backup data is to enable restoration of the system in the unlikely circumstance of a catastrophic event that causes loss of system software. In the face of such an event, in order to return to operational status, once the system hardware and infrastructure have been determined sound or returned to sound condition, it will be necessary to reload the operating system and restore the system from the backup data. This will require not only the offsite backup data, but also access to media containing the operating system software, *Legato* Networker software, and indexes to the backup data. Accordingly, it is necessary to secure in offsite storage the operating system software media, Networker software media, and media containing the indexes for backup data, as well as the backup data themselves.

One approach offered by Networker for implementing off-site backups is to clone a full system backup, so that the cloned copy may be stored off site. Another approach is to create a separate pool of tapes for off-site backups and do a full backup to that separate pool; the second full backup set may then be removed for off-site storage. Although this may provide more assurance of reliable recovery than is provided by cloning and some sites may choose to take this approach, it has the disadvantage of placing more demand on system resources than cloning. The procedures documented here are for cloning.

To set up the system for off-site backups, it is necessary to create a label template (used by Networker to create internal labels for tapes) and create a clone pool for the tapes to be used in cloning the full backup for offsite storage. When creating any volume pool in Networker, it is necessary to specify the type of data to include on the volumes in the pool; one of the preconfigured selections provided by Networker is Backup Clone, and this may be used for the type of data to include on volumes in the clone pool.

The **Activity Checklist** in Table 3.3-5 provides an overview of the process to configure Networker to clone full backups, copy the necessary indexes, and ensure offsite storage of the necessary data.

Table 3.3-5. Configure Networker to Enable Offsite Storage - Activity Checklist

Order	Role	Task	Section	Complete?
1	System Administrator	Set up Label Template.	(P) 3.3.3	
2	System Administrator	Set up Clone Pool.	(P) 3.3.3	

Table 3.3-6 presents the steps required to configure Networker for offsite storage (i.e., to set up for cloning full backups). If you are already familiar with the procedure, you may prefer to use this quick-step table. If you are new to the system, or have not performed this task recently, you should use the following detailed procedure:

1 Access the UNIX command shell.

- The command shell prompt is displayed.

2 Type **setenv DISPLAY *clientname*:0.0** and then press the **Return/Enter** key.

- Use either the terminal/workstation IP address or the machine name for the ***clientname***.

3 Start the log-in to the Tape Backup server by typing **/tools/bin/ssh *hostname*** (e.g., **g0mss07**, **e0mss04**, **l0mss05**, or **n0mss05**) and then press the **Return/Enter** key.

- If you receive the message, **Host key not found from the list of known hosts. Are you sure you want to continue connecting (yes/no)?** type **yes** ("**y**" alone does not work).
- If you have previously set up a secure shell passphrase and executed **sshremote**, a prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears; continue with Step 4.
- If you have not previously set up a secure shell passphrase, go to Step 5.

4 If a prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears, type your ***Passphrase*** and then press the **Return/Enter** key. Go to Step 6.

- This procedure assumes you are set up as an administrative user. If you are not, and are not **root**, you will not be able to change the configuration.

5 At the **<*user@remotehost*>'s password:** prompt, type your ***Password*** and then press the **Return/Enter** key.

- This procedure assumes you are set up as an administrative user. If you are not, and are not **root**, you will not be able to change the configuration.
- You are authenticated and returned to the UNIX prompt.

6 Execute the NetWorker Admin program by entering **nwadmin &** and then press the **Return/Enter** key.

- The **nwadmin** window is displayed.

7 To begin creation of a label template, follow menu path **Customize→Label Templates . . . .**

- The **Label Templates** window is displayed.

8 Click on the **Create** button.

- The data fields are cleared and the cursor is displayed in the **Name:** field.

9 Type **Full Clone** and then press the **Tab** key.

- The typed entry is displayed in the **Name:** field and the cursor is displayed in the **Fields:** field.

10 Type **<*NetworkerHostName*>.ecs.nasa.gov** and then press the **Tab** key.

- For **<*NetworkerHostName*>**, use the Tape Backup server for Networker at the local site (e.g., **g0mss07**, **e0mss04**, **l0mss05**, or **n0mss05**).
- The typed entry is displayed in the **Fields:** field and in the list window immediately below the field.

11 Replace the entry in the **Fields:** field with **Full** (e.g., use the mouse to highlight the entry in the field and then type **Full** over it, or click at the end of the field and use the backspace key to delete the entry before typing **Full**) and then press the **Tab** key.

- The typed entry is displayed in the **Fields:** field and in the list window immediately below the field.

12 Replace the entry in the **Fields:** field with **001-999** (e.g., use the mouse to highlight the entry in the field and then type **001-999** over it, or click at the end of the field and use the backspace key to delete the entry before typing **001-999**) and then press the **Tab** key.

- The typed entry is displayed in the **Fields:** field and is added to the list window immediately below the field.

13 In the **Separator:** field, click on the selection button next to the symbol to be used as a separator between components of the labels (choices are "**.**", "**_**", "**:**", and "**-**"; use the "**.**").

- The button changes color to indicate the selection.

14 Click on the **Apply** button.

- The **Next:** field displays **<*NetworkerHostName*>.ecs.nasa.gov.Full.001** to indicate the next label that will be applied.

15 Follow menu path **File→Exit**.

- The **Label Templates** window is closed.

16 To begin creation of the Full Backup clone pool, on the Networker main window, follow menu path **Media→Pools . . . .**

- The **Pools** window is displayed.

17 Click on the **Create** button.

- The cursor is displayed in the **Name:** field.

18 Type **Full Clone** and then press the **Tab** key.

- The typed entry is displayed in the **Name:** field.

19 In the **Enabled:** field, make sure that the selection button for **Yes** indicates selection (click on the button if necessary).

- The selection button color indicates selection.

20 Click on the pull-down arrow at the right of the **Pool Type:** field and, holding down the right mouse button, drag to select **Backup Clone**.

- The selection is displayed in the **Pool Type:** field.

21 Click on the pull-down arrow at the right of the **Label Template:** field and, holding down the right mouse button, drag to select **Full Clone**.

- The selection is displayed in the **Label Template:** field.

22 In the **Store Index Entries:** field (use the scroll bar on the right side of the window to scroll down if necessary), click on the selection button for **Yes**.

- The button color changes to indicate selection.

23 Click on the **Apply** button.

- **Full Clone** is displayed in the **Pools:** list.

24 In the **Pools:** list, click on **Full**.

- **Full** is highlighted and data for the **Full** pool are displayed in the appropriate data fields.

25 To ensure that the **Full** pool can be used for full backups, in the **Enabled:** field, make sure that the selection button for **Yes** indicates selection (click on the button if necessary).

- The selection button color indicates selection.

26 Follow menu path **File→Exit** (in the **Pools:** window).

- The **Pools:** window is closed.

27 Follow menu path **File→Exit** (in the **nwadmin** window).

- The **nwadmin** window is closed.

Table 3.3-6. Configure Networker to Enable Offsite Storage

Step	What to Enter or Select	Action to Take
1	Access the UNIX command shell	
2	**setenv DISPLAY *clientname*:0.0**	enter text; press **Return/Enter**
3	**/tools/bin/ssh *hostname***	enter text; press **Return/Enter**
4	***Passphrase* or-** (No entry)	enter text; press **Return/Enter** -or- (No action)
5	***Password***	enter text; press **Return/Enter**
6	**nwadmin &**	enter text; press **Return/Enter**
7	Menu path **Customize→Label Templates . . .**	**click** option
8	Activate the **Create** button	**single-click**
9	Type **Full Clone** in the **Name:** field and then **Tab** to the **Fields:** field	enter text; press **Tab**
10	Type **<*NetworkerHostName*>.ecs.nasa.gov** in the **Fields:** field and then **Tab** to display the entry in the list window	enter text; press **Tab**
11	Enter **Full** in the **Fields:** field and then **Tab** to display the entry in the list window	enter text; press **Tab**
12	Enter **001-999** in the **Fields:** field and then **Tab** to display the entry in the list window	enter text; press **Tab**
13	In the **Separator:** field, select **.** as the separator to be used between components of the labels	**click** select
14	Activate the **Apply** button	**single-click**
15	Menu path **File →Exit**	**click** option
16	Menu path **Media →Pools . . .**	**click** option
17	Activate the **Create** button	**single-click**
18	Type **Full Clone** in the **Name:** field and then **Tab** to the **Enabled:** field	enter text; press **Tab**
19	In the **Enabled:** field, ensure that the selection button for **Yes** is selected	**single-click** (if necessary)
20	Activate **Pool Type:** pull-down arrow and select **Backup Clone**	**click** option
21	Activate **Label Template:** pull-down arrow and select **Full Clone**	**click** option
22	In the **Store Index Entries:** field, select **Yes**	**single-click**
23	Activate the **Apply** button	**single-click**
24	In the **Pools:** list, highlight **Full**	**single-click**
25	In the **Enabled:** field, ensure that the selection button for **Yes** is selected	**single-click** (if necessary)
26	Menu path **File →Exit** (for the **Pools:** window)	**click** option
27	Menu path **File →Exit** (for the **nwadmin** window)	**click** option

3.3.4 File Restore

SINGLE OR MULTIPLE FILES RESTORE

From time to time, individual files or groups of files (but not all files) will have to be restored from an Incremental or Full backup tape(s) due to error or system failure. This can be accomplished using the following file restoration procedure.

The File Restore process begins when the requester submits a request to the System Administrator, who restores the file(s) and notifies the requester when complete.

The **Activity Checklist** in Table 3.3-7 provides an overview of the file restore process.

Table 3.3-7. File Restore - Activity Checklist

Order	Role	Task	Section	Complete?
1	Requester	Submit Request for File Restore to System Administrator	(I) 3.3.4	
2	System Administrator	Restore file(s).	(P) 3.3.4	
3	System Administrator	Inform Requester of completion.	(I) 3.3.4	
4	System Administrator	Complete System Restore/Partition Restore	(P) 3.3.4	

Detailed procedures for tasks performed by the System Administrator are provided in the sections that follow.

The procedures assume that the requester's application for a file restore has already been approved by the System Administrator. In order to perform the procedure, the System Administrator must have obtained the following information from the requester:

a. Name of machine to be restored

b. Name of file(s) to be restored

c. Date from which to restore

d. User ID of the owner of the file(s) to be restored

e. Choice of action to take when conflicts occur. Choices are:

- Rename current file
- Keep current file
- Write over current file with recovered file

Table 3.3-8 presents the steps required to restore a file. If you are already familiar with the procedure, you may prefer to use this quick-step table. If you are new to the system, or have not performed these tasks recently, you should use the following detailed procedure:

1 Access the UNIX command shell.

- The command shell prompt is displayed.

2 Type **setenv DISPLAY *clientname*:0.0** and then press the **Return/Enter** key.

- Use either the terminal/workstation IP address or the machine name for the ***clientname***.

3 To start the log-in to the machine to be restored, type **/tools/bin/ssh <*hostname*>** and then press the **Return/Enter** key.

- If you receive the message, **Host key not found from the list of known hosts. Are you sure you want to continue connecting (yes/no)?** type **yes** ("**y**" alone does not work).
- If you have previously set up a secure shell passphrase and executed **sshremote**, a prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears; continue with Step 4.
- If you have not previously set up a secure shell passphrase, go to Step 5.

4 If a prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears, type your ***Passphrase*** and then press the **Return/Enter** key. Go to Step 6.

- Or press the **Return/Enter** key twice to get to the Password prompt.

5 At the **<*user@remotehost*>'s password:** prompt, type your ***Password*** and then press the **Return/Enter** key**.**

- Remember that your password is case sensitive.
- You are authenticated as yourself and returned to the Unix prompt.

NOTE: Before executing the NetWorker Recovery ensure, that you are in the

/data1/COTS/networker directory.

6 Execute the **NetWorker Recovery** program by entering **nwrecover &**, and then press the **Return/Enter** key.

- A window opens for the Networker Recovery program.
- You are now able to perform the file restoration.

7 Click to select the **file(s)/directory(ies) to be restored** in the directory display.

- Drag scroll bar with mouse to scroll the list up and down.
- Double click on directory name to list its contents.

8 Click the **Mark** button.

- A check mark next to each selected file indicates that it is designated to be restored.

9 Go to the **Change** menu, select **Browse Time**.

- The **Change Browse Time** window opens.

10 Select the **date from which to restore**.

- NetWorker will automatically go to that day's or a previous day's backup which contains the file.

11 Click the **Start** button.

- The **Conflict Resolution** window opens.

12 Answer **Do you want to be consulted for conflicts** by clicking the **yes** button.

13 Click the **OK** button.

- If prompted with a conflict, choices of action will be: **rename current file**, **keep current file**, or **write over current file with recovered file**. Select the requesters **choice of action to take when conflicts occur**.
- The **Recover Status** window opens providing information about the file restore.
- If all the required tapes are not in the drive, a notice will appear. Click the **OK** button in the notice window.
- If prompted for tapes, click **Cancel** in the **Recover Status** window and execute procedure 3.3.6.2 Indexing Tapes.

14 When a recovery complete message appears, click the **Cancel** button.

15 Go to the **File** menu, select **Exit**.

- The **NetWorker Recovery** program quits.

16 Type **exit**, then press the **Return/Enter** key.

- The **owner of the file(s) to be restored** is logged out.

17 Type **exit** again, then press the **Return/Enter** key.

- You are logged out and disconnected from the **machine to be restored.**

Table 3.3-8. Restore a File - Quick-Step Procedures

Step	What to Enter or Select	Action to Take
1	Access the UNIX command shell	
2	**setenv DISPLAY *clientname*:0.0**	enter text; press **Return/Enter**
3	**/tools/bin/ssh *hostname***	enter text; press **Return/Enter**
4	***Passphrase*** -or- (No entry)	enter text; press **Return/Enter** -or- press **Return/Enter** twice
5	***Password***	enter text; press **Return/Enter**
6	**nwrecover &**	enter text; press **Return/Enter**
7	Select the file(s)/directory(ies) to be restored	**click** select
8	Activate the **Mark** button	**single-click**
9	Menu path **Change** →**Browse Time**	**click** option
10	Select **date from which to restore**	**click** select
11	Activate the **Start** button	**single-click**
12	Select **yes** for **Do you want to be consulted for conflicts?**	**single-click**
13	Activate the **OK** button; address any conflicts	**single-click**
14	Upon completion of recovery, activate the **Cancel** button	**single-click**
15	Menu path **File** → **Exit**	**click** option
16	**exit**	enter text; press **Return/Enter**
17	**exit**	enter text; press **Return/Enter**

3.3.5 Complete System Restore

The Complete System Restore process begins when the requester has determined that a complete system restore is the only way to resolve the problem and has approval from the System Administrator. Once notified of the request, the System Administrator performs restores of all partitions on the system. Afterwards, the System Administrator documents and logs all actions in the log book and notifies the requester that the system restore is complete.

The **Activity Checklist** in Table 3.3-9 provides an overview of the complete system restore process.

Table 3.3-9. Complete System Restore - Activity Checklist

Order	Role	Task	Section	Complete?
1	Requester	Trouble Shoot and Determine that a Complete System Restore is necessary.	(I) 3.3.5	
2	System Administrator	Restore all Partitions on the System	(P) 3.3.5	
3	System Administrator	Document and Log in log book, and Inform Requester of completion.	(I) 3.3.5	

Detailed procedures for tasks performed by the System Administrator are provided in the sections that follow. The procedures assume that the requester's application for a complete system restore has already been approved by the System Administrator. In order to perform the procedures, the System Administrator must have the following information about the requester:

a. Name of system to be restored

b. Date from which to restore

A complete system restore involves restoring all partitions on that system.

Table 3.3-10 presents the steps required to restore a partition. If you are already familiar with the procedure, you may prefer to use this quick-step table. If you are new to the system, or have not performed these tasks recently, you should use the following detailed procedure:

1 Access the UNIX command shell.

- The command shell prompt is displayed.

2 Type **setenv DISPLAY *clientname*:0.0** and then press the **Return/Enter** key.

- Use either the terminal/workstation IP address or the machine name for the ***clientname***.

3 To start the log-in to the host that requires restoration, type **/tools/bin/ssh <*hostname*>** and then press the **Return/Enter** key.

- If you receive the message, **Host key not found from the list of known hosts. Are you sure you want to continue connecting (yes/no)?** type **yes** ("**y**" alone does not work).
- If you have previously set up a secure shell passphrase and executed **sshremote**, a prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears; continue with Step 4.
- If you have not previously set up a secure shell passphrase, go to Step 5.

4 If prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears, type your ***Passphrase*** and then press the **Return/Enter** key. Go to Step 6.

- Or press the **Return/Enter** key twice to get to the Password prompt.

5 At the **<*user@remotehost*>'s password:** prompt, type your ***Password*** then press the **Return/Enter** key**.**

- Remember that your password is case sensitive.
- You are authenticated as yourself and returned to the UNIX prompt.

6 To execute the **NetWorker Administrative** program, enter **nwadmin &** and then press the **Return/Enter** key.

- A window opens for the NetWorker Administrative program.
- You are now able to perform restores of partitions.

7 Go to the **Save Set** menu, select **Recover . . . .**

- The **Save Set Recover** window opens.

8 Click on the pull-down arrow at the right side of the **Client** field and select the **Name of system to be restored** (referred to as **System** in the rest of this procedure).

- The **Save Set** listing updates. This is a listing of partitions on the **System**.
- At this time, note the partitions listed for the **System**. To do a complete system restore, this procedure needs to be performed for each partition listed.

9 In the **Save Set** list, click on the name of the partition for the restoration.

- The name is highlighted and the **Instances** listing is updated.

10 Click on the appropriate **Instance**.

- An Instance is a particular Networker client backup. A listing of Instances is a report detailed with the Networker client backups that have occurred.
- Select an Instance based upon the Date from which to restore(referred to as Date in the rest of this procedure) and an appropriate level; the selection is highlighted.

NOTE: To determine a base **Date**, you must consider the time of day that backups occur. For example, if the backups occur at 02:00 each morning, then a system corrupted at noon on June 6th would require a restoration of the June 6th backup. If the Backups are full or incremental, perform the following actions: Select the most recent full backup that occurred on or prior to the **Date** and perform a partition restore. If the date of this full backup is not the same as the **Date**, perform a partition restore using each incremental backup, in chronological order, between this full backup and the day after the **Date**.

If the backups are of different numerical levels, follow these steps:

1) Select the most recent level **0/full backup** prior to or on the **Date** and perform a restore of the partition.

2) If a level **0/full backup** did not occur on the **Date**, select the most recent backup of the next highest level occurring after this level **0** and prior to or on the **Date**.

3) Perform a restore of the partition.

4) Continue to select the most recent backup of the next highest level occurring between the last used **Instance** and the day after the **Date** until reaching an instance on the **Date**.

- You can double click an **Instance** to see which tape is required.

11 Click the **Recover** button.

- The Save Set Recover Status window opens.
- Clicking the Volumes button will show which tapes are required.

12 Click the **Options** button.

- The **Save Set Recover Options** window opens.

13 Set **Duplicate file resolution** to **Overwrite existing file** by clicking its radio button.

14 Make sure that the **Always prompt** checkbox is not checked.

15 Click the **OK** button.

- The Save Set Recover Options window closes.

16 Click the **Start** button in the **Save Set Recover Status** window.

- Status messages appear in the Status box.
- If prompted for tapes, click the Cancel button in the **Save Set Recover Status** window and follow steps **1-18** of procedure **3.3.6.2** Index tapes(or steps 1-19 of procedures **3.3.6.2** Index Tapes Quick Steps)
- A **recovery complete** message appears when recovery is complete.

17 Click the **Cancel** button after the **recovery complete** message appears.

- The **Save Set Recover Status** window closes.

18 If additional partition restores are required, repeat steps 10 - 17; otherwise go to step 19.

19 When all desired restorations are complete, select **Exit** from the **File** menu to quit the NetWorker Administrative program.

- The **nwadmin** window is closed.

20 At the UNIX prompt for the backup server, type **exit**, then press the **Return/Enter** key.

- The **owner of the file(s) to be restored** is logged out.

21 Type **exit** again, then press the **Return/Enter** key.

- You are logged out and disconnected from the **machine to be restored.**

Table 3.3-10. Restore a Partition - Quick-Step Procedures

Step	What to Enter or Select	Action to Take
1	Access the UNIX command shell	
2	**setenv DISPLAY *clientname*:0.0**	enter text; press **Return/Enter**
3	**/tools/bin/ssh *hostname***	enter text; press **Return/Enter**
4	***Passphrase*** -or- (No entry)	enter text; press **Return/Enter** -or- press **Return/Enter** twice
5	***Password***	enter text; press **Return/Enter**
6	**nwadmin &**	enter text; press **Return/Enter**
7	Menu path **Save Set →Recover . . .**	**click** option
8	Use pull-down arrow in **Client** field to select the **Name of the system to be restored**	**click** option
9	Select the **Save Set**	**single-click**
10	Select the **Instance**	**single-click**
11	Activate the **Recover** button	**single-click**
12	Activate the **Options** button	**single-click**
13	Use radio button to set **Duplicate file resolution** to **Overwrite existing file**	**single-click**
14	Ensure that the **Always prompt** checkbox is NOT checked	**single-click** (if necessary)
15	Activate the **OK** button	**single-click**
16	In the **Save Set Recover Status** window, activate the **Start** button	**single-click**
17	After recovery is complete, activate **Cancel** button	**single-click**
18	For any additional partitions to be restored, repeat steps 10 - 17	
19	Menu path **File →Exit**	**click** option
20	**exit**	enter text; press **Return/Enter**
21	**exit**	enter text; press **Return/Enter**

3.3.6 Tape Handling

The following procedures describe how to label tapes, index tapes, and clean tape drives. Each of these procedures contains detailed steps that explain how to complete the procedure properly. Each tape handling procedure is significant in maintaining a working backup system. DAAC scheduled backups depend on proper maintenance of tape media and tape drives. Listed are complete explanations of the procedures and their relevance.

The **Activity Checklist** in Table 3.3-11 provides an overview of the tape handling process.

Table 3.3-11. Tape Handling - Activity Checklist

Order	Role	Task	Section	Complete?
1	System Administrator	Labeling Tapes	(I) 3.3.6.1	
2	System Administrator	Indexing Tapes	(P) 3.3.6.2	
3	System Administrator	Tape Drive Cleaning	(P) 3.3.6.3	

3.3.6.1 Labeling Tapes

The Tape Labeling process begins when the System Administrator is performing procedures 3.3.1 Incremental Backup or 3.3.2 Full Backup (or their associated Quick Steps) and runs out of tapes. The tape(s) must be installed in the jukebox and labeled. NetWorker uses tape labels for identification. The label that NetWorker creates is on the tape media itself, rather than a sticker on the outside of the tape cassette. An index is kept by NetWorker associating tape labels with particular backups/data. When you select files to be recovered using the NetWorker Recovery window or view saved sets on a backup volume using the Volume Management window in NetWorker, you are viewing this index. After labeling the required tape(s), the System Administrator resumes procedure 3.3.1 or 3.3.2.

Table 3.3- 12. Labeling Tapes - Activity Checklist

Order	Role	Task	Section	Complete?
1	System Administrator	Install Required Tape(s) in Jukebox	(P) 3.3.6.1.1	
2	System Administrator	8mm, D3, or DLT Tapes Labeling Process	(P) 3.3.6.1.2	

Detailed procedures for tasks performed by the System Administrator are provided in the sections that follow.

3.3.6.1.1 Install Required Tape(s) in Jukebox

The procedures assume that the System Administrator was previously executing procedure 3.3.1 or 3.3.2. In order to perform the procedures, the System Administrator must have obtained the following:

a. Blank tape(s)

All tapes are stored in the storage cabinet located in the control room. There are five tapes in each box, and every box of tapes has a unique number. To begin finding tapes for recycling to be labeled and installed in the Jukebox, the lowest numbers of a tape or a box of tapes should be used. Do not recycle any tape or box of tapes that the numbers are higher or current.

3.3.6.1.2 8mm, D3, or DLT Tapes Labeling Process

Table 3.3-13 presents the steps required to label tapes. The process for labeling Digital Linear Tapes (DLTs) differs from that for labeling 8mm tapes or D3 tapes only in the host reflected in the name (see Step 11 below). If you are already familiar with the procedure, you may prefer to use the quick-step table. If you are new to the system, or have not performed this task recently, you should use the following detailed procedure:

1 Access the UNIX command shell.

- The command shell prompt is displayed.

2 Type **setenv DISPLAY *clientname*:0.0** and then press the **Return/Enter** key.

- Use either the terminal/workstation IP address or the machine name for the ***clientname***.

3 To start the log-in to the Tape Backup server, type **/tools/bin/ssh *hostname*** (e.g., **g0mss07**, **e0mss04**, **l0mss05**, or **n0mss05**) and then press the **Return/Enter** key.

- If you receive the message, **Host key not found from the list of known hosts. Are you sure you want to continue connecting (yes/no)?** type **yes** ("**y**" alone does not work).
- If you have previously set up a secure shell passphrase and executed **sshremote**, a prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears; continue with Step 4.
- If you have not previously set up a secure shell passphrase, go to Step 5.

4 If a prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears, type your ***Passphrase*** and then press the **Return/Enter** key. Go to Step 6.

- Or press the **Return/Enter** key twice to get to the Password prompt.

5 At the **<*user@remotehost*>'s password:** prompt, type your ***Password*** and then press the **Return/Enter** key.

- Remember that your password is case sensitive.
- You are authenticated as yourself and returned to the UNIX prompt.

6 Log in as root by typing **su** and then press the **Return/Enter** key.

- A password prompt is displayed.

7 Enter the ***RootPassword***, then press **Return/Enter.**

- Remember that passwords are case sensitive.
- You are authenticated as root and returned to the UNIX prompt.

8 To launch the **NetWorker Administrative** program GUI, enter **nwadmin &** and then press the **Return/Enter** key.

- The **NetWorker Administrative** program GUI is displayed.

9 Insert the blank tape(s) in the jukebox's cartridge, then install the cartridge in the jukebox.

- Remove all non-blank tapes from the cartridge or else they will be re-labeled and any data on the tapes will be lost.
- Slot 11 is the non-removable slot within the jukebox. This usually contains a cleaning tape. Do not enter any tape in Slot 11 for labeling.
- It is OK to leave empty slots.

10 Click the **Label** button from the menu bar.

- The **Jukebox Labeling** window opens.

11 In the **Starting with:** field, enter the tape label you wish to use for the first tape in the sequence and then press the **Tab** key.

- Tape labels are named by using the host name (e.g., **sprn1sgi**, or, for DLTs, **SPRDLT**), a dot or period, and a sequential number (e.g., **001**, **002**).
- By default, the system will prompt you with the next label in the sequence (e.g., **sprn1sgi.001**, or, for DLTs, **SPRDLT.001**).
- The cursor moves to the **First slot:** field.

12 In the **First slot:** field, enter **1** or the slot containing the first volume to be labeled and then press the **Tab** key.

- Slot 1 is at the top of the cartridge.
- The cursor moves to the **Last slot:** field.

13 In the **Last slot:** field, enter **10** or the slot containing the last volume to be labeled.

- Slot 10 is at the bottom of the cartridge (except for Slot 11, with the cleaning cartridge)..

14 Click the **OK** button.

- A status message appears and updates.
- Labeling a full cartridge of tapes takes about 15 minutes.

15 When the status in the **Jukebox Labeling** window reads **finished**, click the **Cancel** button.

- The **Jukebox Labeling** window closes.

16 Go to the **File** menu and select **Exit**.

17 Put a sticker on the outside of each tape cassette.

- This is done in order for you to identify each tape.

Table 3.3-13. 8mm, D3, or DLT Tapes Labeling Process

Step	What to Enter or Select	Action to Take
1	Access the UNIX command shell	

2	**setenv DISPLAY *clientname*:0.0**	enter text; press **Return/Enter**
3	**/tools/bin/ssh *hostname***	enter text; press **Return/Enter**
4	***Passphrase*** -or- (No entry)	enter text; press **Return/Enter** -or- press **Return/Enter** twice
5	***Password***	enter text; press **Return/Enter**
6	Type **su**	enter text; press **Return/Enter**
7	***RootPassword***	enter text; press **Return/Enter**
8	**nwadmin &**	enter text; press **Return/Enter**
9	Place cartridge with blank tapes in jukebox	mount cartridge
10	Activate the **Label** button	**single-click**
11	Type **<*host*>.*nnn*** in the **Starting with:** field	enter text; press **Tab**
12	Type **1** (or first occupied slot) in the **First Slot** field	enter text; press **Tab**
13	Type **10** (or last occupied slot) in the **Last Slot** field	enter text; press **Return/Enter**
14	Activate the **OK** button.	**single-click**
15	When **finished**, activate the **Cancel** button	**single-click**
16	Menu path **File→Exit**	**click** option
17	Put a sticker on the outside of each tape cassette	mark tapes for identification

3.3.6.2 Indexing Tapes

The Indexing Tapes process begins when the System Administrator has finished performing procedures 3.3.6.1, (**Tape Labeling**). If the tape(s) is/are not ***indexed/inventoried,*** NetWorker will not be aware of it/them. After indexing the required tape(s), the System Administrator resumes procedure 3.3.1 or 3.3.2.

The **Activity Checklist** in Table 3.3-14 provides an overview of the indexing tapes process.

Table 3.3-14. Indexing Tapes - Activity Checklist

Order	Role	Task	Section	Complete?
1	System Administrator	Pull Required Tape(s) from Tape Storage.	(I) 3.3.5.2.1	
2	System Administrator	Index Tapes	(P) 3.3.5.2.2	

3.3.6.2.1 Pull Required Tape(s) from Tape Storage

In order to perform the procedure, the System Administrator must have obtained the following:

a. The required tape(s).

This may necessitate retrieving tapes from secure offsite storage if other backups are unavailable.

3.3.6.2.2 Index Tapes

Detailed procedures for tasks performed by the System Administrator are provided in the sections that follow.

The procedures assume that the System Administrator has previously executed procedure 3.3.6.1, **Tape Labeling**.

Table 3.3-15 presents the steps required to index tapes. If you are already familiar with the procedure, you may prefer to use this quick-step table. If you are new to the system, or have not performed this task recently, you should use the following detailed procedure:

1 Access the UNIX command shell.

- The command shell prompt is displayed.

2 Type **setenv DISPLAY *clientname*:0.0** and then press the **Return/Enter** key.

- Use either the terminal/workstation IP address or the machine name for the ***clientname***.

3 To start the log-in to the Tape Backup server, type **/tools/bin/ssh *hostname*** (e.g., **g0mss07**, **e0mss04**, **l0mss05**, or **n0mss05**) and then press the **Return/Enter** key.

- If you receive the message, **Host key not found from the list of known hosts. Are you sure you want to continue connecting (yes/no)?** type **yes** ("**y**" alone does not work).
- If you have previously set up a secure shell passphrase and executed **sshremote**, a prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears; continue with Step 4.
- If you have not previously set up a secure shell passphrase, go to Step 5.

4 If a prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears, type your ***Passphrase*** and then press the **Return/Enter** key. Go to Step 6.

- Or press the **Return/Enter** key twice to get to the Password prompt.

5 At the **<*user@remotehost*>'s password:** prompt, type your ***Password*** and then press the **Return/Enter** key.

- Remember that your password is case sensitive.
- You are authenticated as yourself and returned to the Unix prompt.

6 To launch the **NetWorker Administrative** program GUI, enter **nwadmin &** and then press the **Return/Enter** key.

- The **NetWorker Administrative** program GUI is displayed.
- You are now able to index tapes.

7 If it is desired to see what tapes are currently available to **NetWorker**, click the **Mount** button.

- The **Jukebox Mounting** window is displayed.

8 If necessary, to dismiss the **Jukebox Mounting** window, click the **Cancel** button.

- The **Jukebox Mounting** window is closed.

9 Put the required tape(s) in the jukebox's cartridge and install the cartridge in the jukebox.

- For instructions, refer to the jukebox's documentation.

10 Go to the **Media** menu, select **Inventory**.

- The **Jukebox Inventory** window opens.

11 In the **First slot:** field, enter **1** or the slot containing the first volume to be indexed and then press the **Tab** key.

- Slot 1 is at the top of the cartridge.
- The cursor moves to the **Last slot:** field.
- It is OK to have empty slots or slots with tapes which have already been indexed.

12 In the **Last slot:** field, enter **10** or the slot containing the last volume to be indexed.

13 Click the **OK** button.

- A checking volume message appears and updates.
- Performing an inventory on a full cartridge takes twenty to thirty minutes.

14 When the status in the **Jukebox Inventory** window says **finished**, click the **Cancel** button.

- The **Jukebox Inventory** window closes.

15 Click the **Mount** button to verify that the indexing worked.

- The **Jukebox Mounting** window opens.
- The required tape(s) should be shown. If not, repeat from step 10.

16 Click the **Cancel** button.

- The **Jukebox Mounting** window closes.

17 Go to the **File** menu, select **Exit**.

18 At the UNIX prompt for the ***backup server***, type **exit**, then press **Return**.

19 Type **exit** again, then press **Return**.

Table 3.3-15. Index Tapes - Quick-Step Procedures

Step	What to Enter or Select	Action to Take
1	Access the UNIX command shell	
2	**setenv DISPLAY *clientname*:0.0**	enter text; press **Return/Enter**
3	**/tools/bin/ssh *hostname***	enter text; press **Return/Enter**
4	***Passphrase*** -or- (No entry)	enter text; press **Return/Enter** -or- press **Return/Enter** twice
5	***Password***	enter text; press **Return/Enter**

6	**nwadmin**	enter text; press **Return/Enter**
7	If desired, activate the **Mount** button	**single-click**
8	If necessary to dismiss **Jukebox Mounting** window, activate the **Cancel** button	**single-click**
9	Place cartridge, with tapes to be indexed, in jukebox	mount cartridge
10	Menu path **Media** →**Inventory**	**click** option
11	Type **1** (or first occupied slot) in the **First Slot** field	enter text; press **Tab**
12	Type **10** (or last occupied slot) in the **Last Slot** field	enter text
13	Activate the **OK** button	**single-click**
14	When **finished**, activate the **Cancel** button	**single-click**
15	Activate the **Mount** button	**single-click**
16	Activate the **Cancel** button	**single-click**
17	Menu path **File** →**Exit**	**click** option
18	**exit**	enter text; press **Return/Enter**
19	**exit**	enter text; press **Return/Enter**

3.3.6.3 Tape Cleaning Process

The system will at times prompt for drive(s) cleaning, typically during non-processing periods. However, during the course of the tape backup process period, the drive(s) may send a request for cleaning. Manual cleaning should be performed each time tapes are installed in the jukebox. Maintaining clean drives can help prevent backup interruption that may occur due to unclean tape drive heads. If the system prompts for drive(s) cleaning, follow the detailed steps below:

1 Access the UNIX command shell.

- The command shell prompt is displayed.

2 Type **setenv DISPLAY *clientname*:0.0** and then press the **Return/Enter** key.

- Use either the terminal/workstation IP address or the machine name for the ***clientname***.

3 To start the log-in to the Tape Backup server, type **/tools/bin/ssh *hostname*** (e.g., **g0mss07**, **e0mss04**, **l0mss05**, or **n0mss05**) and then press the **Return/Enter** key.

- If you receive the message, Host key not found from the list of known hosts. Are your sure you want to continue connecting (yes/no)? type yes ("y" alone does not work).
- If you have previously set up a secure shell passphrase and executed sshremote, a prompt to Enter passphrase for RSA key '<*user@localhost*>' appears; continue with Step 4.
- If you have not previously set up a secure shell passphrase, go to Step 5.

4 If a prompt to **Enter passphrase for RSA key '<*user@localhost*>'** appears, type your ***Passphrase*** and then press the **Return/Enter** key. Go to Step 6.

- Or press the **Return/Enter** key twice to get to the Password prompt.

5 At the **<*user@localhost*>'s password:** prompt, type your ***Password*** and then press the **Return/Enter** key.

- Remember that your password is case sensitive.
- You are authenticated as yourself and returned to the UNIX prompt.

6 To launch the **NetWorker Administrative** program GUI, enter **nwadmin &** and then press the **Return/Enter** key.

- A **NetWorker Administrative** program GUI is displayed.

7 Highlight the desirable drive(s) that the system has prompted for cleaning.

8 Click dismount from the menu bar and wait a few minutes for the drive to be dismounted completely.

9 Repeat Steps 6 - 8 on the second drive until both are dismounted.

To open the Exabyte door, turn the key in the door counterclockwise. The last tape at the bottom of the cartridge is the cleaning tape. Remove it from the slot field and insert it gently into each drive below. Wait until the tape has been ejected and the flashing lights on the drive are off before removing the tape from the drive. Insure that the cleaning tape is still usable before each use. Cleaning tapes will expire after several uses. After each use, mark the appropriate box on the surface of the tape to maintain a list of usage. Insert the cleaning tape back into the last slot and lock the Exabyte door.